

**AMENDED CLAIMS**

[received by the International Bureau on 06 May 2005 (06.05.2005);  
original claims 1-14, 16-20 amended, remaining claims unchanged (3 pages)]

**Claims**

1. A method for strengthening the structure of a protein-containing food product during a pasteurization heat treatment of said product by forming disulfide bonds  
5 between the proteins to form a protein space network, **characterized** in that the method comprises
  - adding modified protein to said product before said heat treatment, which protein is modified by cleaving at least one disulfide bond originally present in said protein to obtain free sulfhydryl groups, and
  - 10 – heating said product for 15 minutes or less to cause an interchange reaction by said free sulfhydryl groups to form said structure strengthening disulfide bridges between proteins.
2. The method of claim 1, **characterized** in that said heating time is 15 seconds  
15 to 14 minutes, preferably 1–10 minutes, more preferably 1–3 minutes.
3. The method of claim 1 or 2, **characterized** in that said heating temperature is 70–85 °C, preferably 70–80 °C, more preferably 72–75 °C.
- 20 4. The method of any of the preceding claims, **characterized** in that said protein has been modified by contacting it with sulfite ion forming reagent, such as alkali metal or earth alkali metal sulfite, hydrogen sulfite or metabisulfite or combinations thereof, to sulfonate said protein.
- 25 5. The method of any of the preceding claims, **characterized** in that the amount of free sulfhydryl groups in the total protein of the product before the interchange modification is 0.5–60 µmol/g protein, preferably 5–20 µmol/g protein.
6. The method of any of the preceding claims, **characterized** in that said modified  
30 protein comprises whey protein or soy protein.
7. The method of any of the preceding claims, ~~**characterized** in that said food product is yoghurt, pudding, spread, other milk product, dough, animal fodder or pet food.~~
- 35 8. A method for preparing a protein-containing food product having protective functional properties, **characterized** in that the method comprises

– adding modified protein to said product, which protein is modified by cleaving at least one disulfide bond originally present in said protein to obtain free sulfhydryl groups, and

– heating said product for 15 minutes or less to cause an interchange reaction by said free sulfhydryl groups to further cleave other disulfide bridges between proteins to obtain free sulfhydryl groups providing said functional properties.

9. The method of claim 8, **characterized** in that said heating time is 15 seconds to 14 minutes, preferably 1–10 minutes, more preferably 1–3 minutes.

10. The method of claim 8 or 9, **characterized** in that said heating temperature is 70–85 °C, preferably 70–80 °C, more preferably 72–75 °C.

11. A protein-containing food product comprising a protein space network strengthening the structure of said product, which network is formed in a pasteurization heat treatment by disulfide bonds between proteins, **characterized** in that said protein network has been created by adding modified protein to the product before said heat treatment, which protein is modified by cleaving at least one disulfide bond originally present in said protein to obtain free sulfhydryl groups which have formed said structure strengthening disulfide bonds in an interchange reaction during a heating of 15 minutes or less.

12. The protein-containing product of claim 11, **characterized** in that said heating time is 15 seconds to 14 minutes, preferably 1–10 minutes, more preferably 1–3 minutes.

13. The protein-containing product of claim 11 or 12, **characterized** in that said heating temperature is 70–85 °C, preferably 70–80 °C, more preferably 72–75 °C.

14. ~~The protein-containing product of any of the claims 11–13, characterized in that said protein has been modified by contacting it with sulfite ion forming reagent, such as alkali metal or earth alkali metal sulfite, hydrogen sulfite or metabisulfite or combinations thereof, to sulfonate said protein.~~

~~15. The protein-containing product of any of the claims 11–14, characterized in that the amount of free sulfhydryl groups in the total protein of the product before the interchange modification is 0.5–60 μmol/g protein.~~

16. The protein-containing product of any of the claims 11–15, **characterized** in that said modified protein comprises whey protein or soy protein.

5 17. The protein-containing product of any of the claims 11–16, **characterized** in that said food product is yoghurt, pudding, spread, other milk product, dough, animal fodder or pet food.

10 18. A protein-containing food product having protective functional properties, **characterized** in that said product comprises free sulfhydryl groups created by adding modified protein to the product before pasteurization heat treatment, which protein is modified by cleaving at least one disulfide bond originally present in said protein, to obtain free sulfhydryl groups to further cleave other disulfide bonds between proteins during a heating of 15 minutes or less to obtain free sulfhydryl groups providing said functional properties.

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19. The protein-containing product of claim 11, **characterized** in that said heating time is 15 seconds to 14 minutes, preferably 1–10 minutes, more preferably 1–3 minutes.

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20. The protein-containing product of claim 11 or 12, **characterized** in that said heating temperature is 70–85 °C, preferably 70–80 °C, more preferably 72–75 °C.